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REVISION OF AUSTRALIAN SYRPHIDAE (DIPTERA).

PART ii, WITH A SUPPLEMENT TO PART i.

By E. W. FERGUSON, M.B., Ch.M., D.P.H.

(Sixteen Text-figures.)
[Read 27th October, 1926.]

Supplement to Part i.

Subfamily CERIOIDINAE.

An important paper on this subfamily by Shannon (*Ins. Ins. Mens.*, 13, 1925, p. 48-52) was unfortunately overlooked. In this paper the subfamily is divided into four genera according to the following key:

A1. Antennal process very elongate, distinctly longer than length of first antennal joint; a stigmatical cross-vein, or at least a distinct thickening present; metasternum membranous behind; hypopygium of male usually globose.
  B1. Abdomen slightly narrowed basally, anterior corners bright yellow; loop in third vein with a spur .... *Tenthredomyia*, n.g.
  B2. Abdomen distinctly constricted basally, anterior corners not bright yellow; third vein rarely with spur (present in *pleuralis* Coq.) .. *Monoceromyia* Shaw
A2. Antennifer very short or absent, rarely equalling half the length of first antennal joint; no stigmatical cross-vein or thickening present; abdomen constricted basally, without yellow spots at anterior corners; third vein with spur; hypopygium of male usually pointed apically.
  B3. Metasternum completely girdled with chitin .... *Polybiomyia*, n.g.
  B4. Metasternum membranous behind .... *Cerioides* Rod.

By this key the Australian species would fall into the three genera, *Tenthredomyia*, *Monoceromyia* and *Cerioides*, as follows: *ornatus*, *australis*, *opuntiae*, *platypus*, *alboseta*, *variabilis*, *apicalis* into *Tenthredomyia*; *macleayi*, *doddi*, *mastersi*, *facialis*, *subarmata* into *Monoceromyia* and *breviscapa* into *Cerioides*.

Not all the characters cited in the key under these genera are present in Australian species; thus the anterior corners of the abdomen are not bright yellow in several species and the spur to the loop in third vein is not usually (if ever) present.

In the same paper Shannon describes a new species *Tenthredomyia saundersi* from Sydney and gives note on a specimen identified as *T. australis* (Macq.) which is clearly the species I identified as *Cerioides ornatus* (Saunders). The new species (*saundersi*) is probably identical with my *Cerioides variabilis*, but the scutellum is stated to have the posterior half yellow, not the basal, as in *variabilis*, and the second abdominal segment has an apical yellow margin, which, though present in the female, I have not seen in any male in the series I have had under examination.

Subfamily ERISTALINAE.

ERISTALIS ARVORUM F.

Specimens of the species commented upon under this name in Part i were submitted to Dr. G. A. K. Marshall of the Imperial Bureau of Entomology. In reply Dr. Marshall writes: "The ♂ is probably *Eristalis arvorum* F., but abdomen is in bad condition; the ♀ is typically *suavissimus* Wlk.". While it is possible that both *E. arvorum* and *E. suavissimus* occur in Australia, I am not yet certain

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ERISTALIS COPIOSUS Walker.

This species proves to be identical with *E. sinuatus* Thoms. (= *decorus* Macq.) from comparison of a specimen with the type in the British Museum.

Subfamily MICRODONTINAE.

MICRODON VITTATUS Macq.

Paragus (?) *pachypus* Bigot (1884) should be added to the synonymy of this species. Dr. Guy Marshall in a letter stated that the type of *Microdon* (*Paragus*) *pachypus* Bigot is in the British Museum. Bigot's species was unknown to me and I had not thought of the possibility of it being a *Microdon*; the description, however, agrees perfectly with *M. vittatus* Macq.

MICRODON CHALYBEUS Ferg.

A specimen (♀) from Cradle Mountain, Tasmania, is in A. L. Tonnoir's collection. The specimen is smaller than usual, but otherwise conforms to mainland specimens.

MICRODON MODESTUS Ferg.

A specimen (♂) is in the National Museum, from Georgetown, Tasmania (C. E. Cole, 4.11.17). This record extends the distribution of the species to Tasmania.

MICRODON NIGROMARGINALIS C. and B.

The description of the puparium was unfortunately based on a specimen that was partly coated with mud and this coating was thicker than was realized. Additional specimens taken at the same place and time are now available and show that the granules are arranged in single series on undulating lines connected by cross lines, the whole forming a reticulum similar to that seen in the puparium of *M. variegatus.*

MICRODON MOESTUS, n. sp.

A black species with reddish-brown legs, black antennae with third joint upturned at tip as in *M. occidentalis* Ferg. Front black, very broad, practically parallel-sided, with whitish appressed pubescence, black around ocelli; face reddish-brown, about as wide as front, moderately densely clothed with white appressed pubescence; cheeks and posterior orbits with white pubescence. Antennae black, first joint short, cylindrical, third elongate, thickened and upturned at apex, the apical portion thinner and pointed, arista shorter than joint, lateral groove extending from below arista to half the length of joint; relative proportion of joints 7 : 3 : 17. Mesonotum black, slightly bronzy, pubescence scanty, dark, longer and pale at sides; scutellum rounded, not dentate, with scanty pubescence, arising from small granules and appearing dark from some directions, pale from others; pleural segments bronze-black, shiny, with mainly pale pubescence. Abdomen dark blackish-brown, each segment with a narrow patch of white pubescence at each side, along posterior margin, not reaching to midline nor to lateral border, but on apical segment forming a longitudinal patch on each side of midline at apex; some white pubescence at each side of base of second segment that the specimens submitted do not belong to but one species. Unfortunately, males and females from the same locality are not available, and until further specimens come to hand it will be necessary to admit *E. arvorum* as well as *E. suavissimus* to the Australian list.

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Length, 9 mm.

Hab.—Tasmania, Hobart (C. E. Cole, 8.12.16).

Described from a single female in the National Museum, Melbourne. The species belongs to the group containing *M. chalybeus*, *M. occidentalis* and *M. dimorphon*, and in colour resembles the female of the latter species; the antennae are, however, different and closer to the shape seen in *M. occidentalis*.

MICRODON spp.

Text-figures are given showing the antennae of all the species of *Microdon*, with the exception of *M. hardyi* Ferg. and *M. pictipennis* Macq. I am indebted to Dr. I. M. Mackerras for the figures.

Location of Types of New Species.

The location of the types of the new species of Syrphidae was inadvertently not given in all cases. For convenience the location of all types so far described is given below.

Cerioides opuntiae	Macleay Museum
,, *platypus*	Australian Museum
,, *alboseta*	Australian Museum
,, *variabilis*	Australian Museum
,, *apicalis*	Australian Museum
,, *macleayi*	Macleay Museum
,, *doddi*	South Australian Museum
,, *facialis*	Macleay Museum
,, *mastersi*	Australian Museum
Eristalis conjunctus	♂, Macleay Museum ♀, National Museum
,, *kershawi*	National Museum
Helophilus terraereginae	South Australian Museum
Microdon alcicornis	Macleay Museum
,, *hardyi*	Coll. Hardy
,, *nicholsoni*	Macleay Museum
,, *macquariensis*	Macleay Museum
,, *waterhousei*	Australian Museum
,, *amabilis*	Queensland Museum
,, *dimorphon*	Macleay Museum
,, *occidentalis*	South Australian Museum
,, *chalybeus*	Coll. Hardy
,, *modestus*	Queensland Museum
,, *barringtonensis*	Macleay Museum
,, *moestus*	National Museum
,, *praetermissus*	South Australian Museum
Criorrhina multicolor	♂, Australian Museum ♀, South Australian Museum
,, *hackeri*	Queensland Museum
,, *fulva*	Macleay Museum
,, *rufocaudata*	Coll. Hardy

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Xylota victoriensis	National Museum
,, *illucens*	National Museum
,, *iridescens*	Macleay Museum
Eumerus argyrogaster	Macleay Museum
,, *simplex*	National Museum
Graptomyza flavicollis	Macleay Museum
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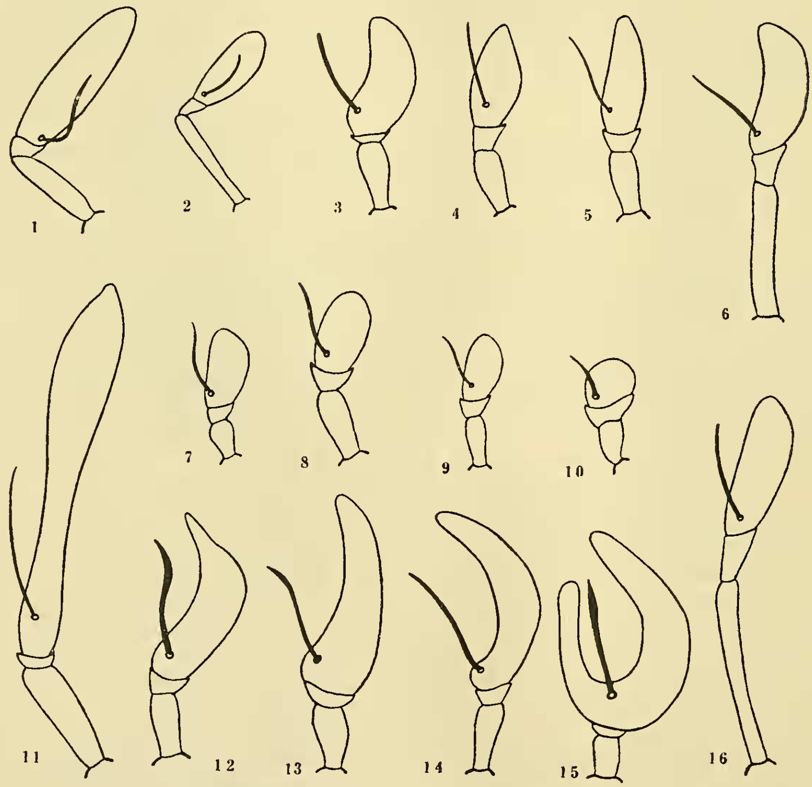
Corrigenda to Part i.

p. 139, line 39, *for* fourth vein (R_{4+5}), *read* fourth vein (M_{1+2})

p. 161, line 26, *for* Meigen, 1922, *read* Meigen, 1822.

p. 168, lines 22 and 23, *delete* "as the western parts of the continent are not represented by any known species". This was written before the accession of the three species from Western Australia recorded in the paper and the excision of the statement was overlooked.



Text-figs. 1-16. *Microdon* spp., antennae.

1 *praetermissus*, 2 *amabilis*, 3 *dimorphon*, 4 *nigromarginalis*, 5 *brachycerus*, 6 *macquariensis*, 7 *modestus*, 8 *barringtonensis*, 9 *vittatus*, 10 *nicholsoni*, 11 *variegatus*, 12 *moestus*, 13 *chalybeus*, 14 *occidentalis*, 15 *alcicornis*, 16 *waterhousei*.

Xylota victoriensis	National Museum
„ *illucens*	National Museum
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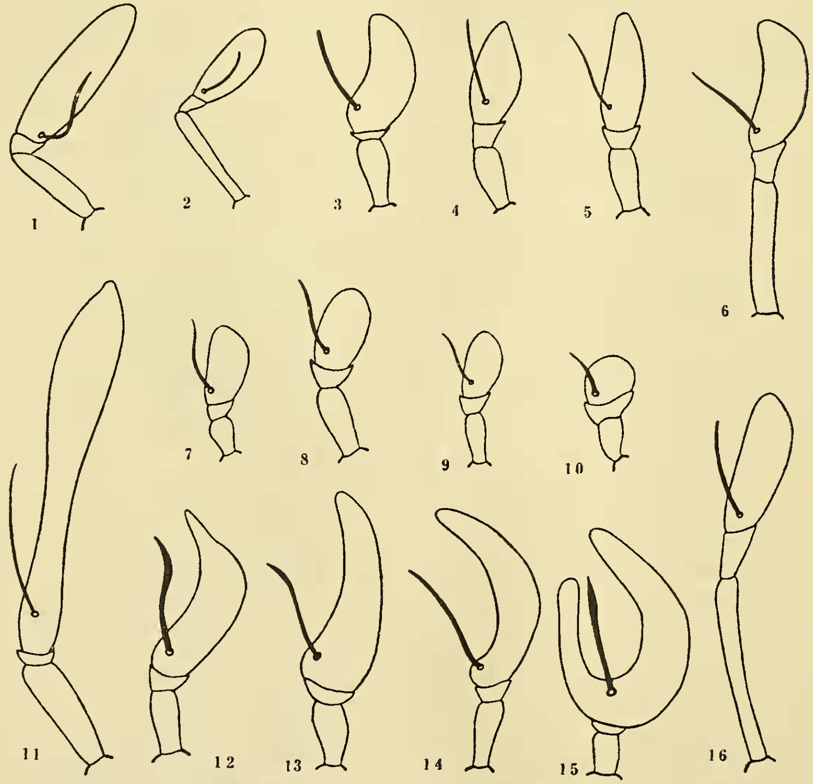

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PART II.

Subfamily MILESIINAE.

Antennae generally pendent, arista dorsal, bare (in Australian genera). Frons prominent, bare or slightly pubescent; eyes generally bare, contiguous or approximate in the male, widely separated in the female; face usually bare. Hind femora generally dentate, spinose or serrate, often thickened. Cross-vein *r-m* at or beyond middle of median cell; R_{4+5} straight or feebly sinuous.

Brunetti, from whom the above is adapted, expresses himself as not quite convinced of the distinctness of the subfamily from the Eristalinae. The only distinction is of course the fact that R_{4+5} is not deeply looped, but this difference seems constant in the Australian species and these form a fairly homogeneous group with the possible exception of *Eumerus*. Concerning the latter, Brunetti remarks: "*Eumerus*, too, is somewhat abnormal, the venation and general appearance being very like those of the *Paragus*-group in Syrphinaê". For the present the genus may be allowed to remain in the Milesiinae, and I would place here all the Australian genera in which *r-m* is at or beyond the middle of the median cell and which do not possess the special characters of the Eristalinae or Cerioidinae. This classification would include the species described by Hardy as *Chrysotoxum elongatum*. I have already given reasons for considering that the species is generically separable from *Chrysotoxum* and the only character in which it differs from other genera in the Milesiinae is the long antenna. Personally, I attach greater weight to the position of *r-m* than to the length of the antenna and have therefore placed the species in a new genus—*Hardimyia*—of the Milesiinae. Whether this course will be approved by dipterologists with a wider knowledge of the Syrphidae of the world remains to be seen. I am convinced at any rate of the necessity of removing the species from *Chrysotoxum*, and know of no genus to which it could with propriety be referred.

Deineches is distinguished by Hardy (1921, p. 18) from *Criorrhina* by the course of Cu_1 + 1st A being parallel to the wing margin. Though this is the case in the type species and in one or two other Australian species, there occurs at least one species in which the course of the conjoined vein is more or less direct to the margin and which cannot be separated from the type of *Deineches* on other structural characters. I have therefore followed Brunetti in sinking *Deineches* as a synonym of *Criorrhina*.

The species included under *Xylota* are somewhat diverse in type and are perhaps representative of more than one genus. I prefer, however, to place them all together. The remaining genus represented in Australia is *Syritta*, of which one native and at least one extralimital species occurs.

Specimens referable to either *Milesia* or *Meredon* have never been recorded.

Table of Genera.

1. Antennae long, porrect .... *Hardimyia*
   Antennae of only moderate length, pendent 2
2. Apical portion of M_{1+2} outwardly angulate in middle .... *Eumerus*
   Apical portion of M_{1+2} more or less straight 3
3. Large robust species, generally with dense clothing .... *Criorrhina*
   Narrow elongate species, bare or with but scanty clothing 4
4. Cross vein *r-m* vertical .... *Syritta*
   Cross vein *r-m* oblique .... *Xylota*

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Criorrhina Meigen, 1822, p. 236.—*Deineches* Walker, 1852, p. 227.—(For other synonymy see Brunetti, 1923, p. 280).

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	Cross vein *r-m* oblique	*Xylota*

CRIORRHINA.

Criorrhina Meigen, 1822, p. 236.—*Deineches* Walker, 1852, p. 227.—(For other synonymy see Brunetti, 1923, p. 280).

Head rather flattened, a little wider below the thorax (apart from pubescence of latter). Eyes bare, not quite touching in ♂, distinctly, though not widely separated in ♀; frons flattened, ending in an antennal prominence, below which the face is excavated distinctly, thence forming a large, stout snout, in which a central knob is moderately distinct. Antennae moderately long, third joint rounded or ovate, deeper than long; arista subbasal, bare. Thorax elongate-oval, rather arched, scutellum concolorous, both densely pubescent, without bristly hairs.

Abdomen varying in shape from nearly rounded to a narrow ellipse, densely pubescent. Legs rather strong, hind femora sometimes thickened, but normally without processes below; hind tibiae often curved, sometimes compressed. Wings with marginal cell widely open; *r-m* far beyond middle of median cell, very oblique—Brunetti, p. 280 (slightly modified).

Two Australian species have been described as belonging to this genus—*C. nudiventris* Macq. and *C. spadix* Hardy. I propose to sink *Deineches* under *Criorrhina*, the genotype of *Deineches* (*D. nigrofulva* Walker) being a synonym of *C. nudiventris*.

Hardy (1921, p. 18) maintains the latter genus as distinct on the character of the "veins that run parallel to the apical border of the wing; these veins merge into each other in a more or less unbroken line in *Deineches* whilst in *Criorrhina* they are separated by a space, thus breaking the line". He admits that "it is doubtful if this character is sufficient to justify generic separation". Brunetti (1923, p. 281) places *Deineches* as a synonym of *Criorrhina*, though the eyes are contiguous in the male.

The Australian species appear to form a fairly homogeneous group, though there are some differences in the head structure and in the course of the combined vein Cu_1 + 1st An. In *C. nudiventris* this runs parallel to the wing margin, while in *C. rufocaudata*, n. sp., which is structurally otherwise similar, the vein runs almost directly to the wing border.

Four new species are added to the genus in the present paper making a total of six.

The distribution is mainly southern and eastern; *C. hackeri* occurs in S. Queensland, *C. ruficaudata* in New South Wales, *C. multicolor* in New South Wales and Queensland, *C. fulva* in S. Australia and *C. spadix* in Tasmania, while *C. nudistylum* ranges from New South Wales into Tasmania.

Table of Species of Criorrhina.

1. First anal vein continued on beyond junction with Cu_1 in a direction subparallel to the hind wing border 2
   First anal vein not continued as above, the combined vein beyond the junction with Cu_1 running to the border more or less in the direction of the course of Cu_1 5
2. Iridescent metallic species, with dense golden pubescent bands on abdomen .... *C. multicolor*, n. sp.
   Non-metallic species, colours mainly black and yellow or fulvous 3
3. Mesonotum yellow with four black vittae .... *C. hackeri*, n. sp.
   Mesonotum largely dark, the colour obscured by dense yellow or greyish tomentum 4
4. Abdomen mainly black, bright fulvous at base (eyes contiguous in ♂) .... *C. nudiventris* Macq.
   Abdomen entirely fulvous; (eyes separated in ♂) .... *C. fulva*, n. sp.
5. Black species with broad reddish-orange tip to abdomen; wings with veins suffused with brown .... *C. rufocaudata*, n. sp.
   Reddish-brown species; wings with a broad brown band along anterior border .... *C. spadix* Hardy

Head rather flattened, a little wider below the thorax (apart from pubescence of latter). Eyes bare, not quite touching in ♂, distinctly, though not widely separated in ♀; frons flattened, ending in an antennal prominence, below which the face is excavated distinctly, thence forming a large, stout snout, in which a central knob is moderately distinct. Antennae moderately long, third joint rounded or ovate, deeper than long; arista subbasal, bare. Thorax elongate-oval, rather arched, scutellum concolorous, both densely pubescent, without bristly hairs.

Abdomen varying in shape from nearly rounded to a narrow ellipse, densely pubescent. Legs rather strong, hind femora sometimes thickened, but normally without processes below; hind tibiae often curved, sometimes compressed. Wings with marginal cell widely open; *r-m* far beyond middle of median cell, very oblique—Brunetti, p. 280 (slightly modified).

Two Australian species have been described as belonging to this genus—*C. nudiventris* Macq. and *C. spadix* Hardy. I propose to sink *Deineches* under *Criorrhina*, the genotype of *Deineches* (*D. nigrofulva* Walker) being a synonym of *C. nudiventris*.

Hardy (1921, p. 18) maintains the latter genus as distinct on the character of the "veins that run parallel to the apical border of the wing; these veins merge into each other in a more or less unbroken line in *Deineches* whilst in *Criorrhina* they are separated by a space, thus breaking the line". He admits that "it is doubtful if this character is sufficient to justify generic separation". Brunetti (1923, p. 281) places *Deineches* as a synonym of *Criorrhina*, though the eyes are contiguous in the male.

The Australian species appear to form a fairly homogeneous group, though there are some differences in the head structure and in the course of the combined vein Cu_1 + 1st An. In *C. nudiventris* this runs parallel to the wing margin, while in *C. rufocaudata*, n. sp., which is structurally otherwise similar, the vein runs almost directly to the wing border.

Four new species are added to the genus in the present paper making a total of six.

The distribution is mainly southern and eastern; *C. hackeri* occurs in S. Queensland, *C. ruficaudata* in New South Wales, *C. multicolor* in New South Wales and Queensland, *C. fulva* in S. Australia and *C. spadix* in Tasmania, while *C. nudistylum* ranges from New South Wales into Tasmania.

Table of Species of Criorrhina.

1. First anal vein continued on beyond junction with Cu_1 in a direction subparallel to the hind wing border 2
First anal vein not continued as above, the combined vein beyond the junction with Cu_1 running to the border more or less in the direction of the course of Cu_1 5
2. Iridescent metallic species, with dense golden pubescent bands on abdomen .... *C. multicolor*, n. sp.
Non-metallic species, colours mainly black and yellow or fulvous 3
3. Mesonotum yellow with four black vittae .... *C. hackeri*, n. sp.
Mesonotum largely dark, the colour obscured by dense yellow or greyish tomentum 4
4. Abdomen mainly black, bright fulvous at base (eyes contiguous in ♂) .... *C. nudiventris* Macq.
Abdomen entirely fulvous; (eyes separated in ♂) .... *C. fulva*, n. sp.
5. Black species with broad reddish-orange tip to abdomen; wings with veins suffused with brown .... *C. rufocaudata*, n. sp.
Reddish-brown species; wings with a broad brown band along anterior border .... *C. spadix* Hardy

CRIORRHINA MULTICOLOR, n. sp.

♂, ♀. Head as wide as thorax; front narrow in ♂, about five times as long as width at vertex, slightly narrowed in middle, thence widened out to antennal tubercle; slightly broader in ♀ at vertex, thence evenly and considerably widened anteriorly; densely clothed with bright golden tomentum with rather sparse golden hairs; ocellary triangle dark brown; antennal tubercle slightly produced, dark reddish-brown, densely clothed at base and sides with bright golden tomentum, somewhat lighter in colour than on front, the tomentum extending further on the tubercle in the ♂ than in the ♀; face with similar golden clothing, parafacials also densely clothed, appearing golden when viewed from in front, but brown when seen from side, the snout slightly produced, with a single slightly emarginate tubercle above and a more acute one on each side at free margin, the lateral portions below the parafacialia destitute of clothing, laevigate and of a deep violet-blue colour; cheeks small, clothed with dark grey tomentum; the occipital region with similar clothing. Antennae dark brown, almost black; first joint short, subcylindrical, second the length of first, but widened at apex, and laterally compressed, third joint broad, reniform, the arista dark brown, situated near base. Eyes bare.

Mesonotum iridescent green with purple reflections, with a pair of rather narrow median lines of deep black extending from anterior margin across suture to opposite wing roots, slightly divergent posteriorly, also with a similar dorso-central black vitta on each side, broad in front, but narrowing to a point posteriorly and extending to posterior margin, these vittae clothed with dense black pile; the humeral angle and lateral margin as far as wing root reddish-brown, the prominences clothed with bright golden pile; suture reddish-brown, not extending across midline; an oblong spot of golden tomentum on each side between humeral prominence and midline; pubescence light brown becoming black posteriorly, rather sparse, denser and bright golden on humeral and lateral prominences. Scutellum light yellow, becoming purplish-brown at the lateral corners, clothed with yellow pubescence. Pleural segments dark brown to black, for the most part dull, but mesopleuron with metallic greenish and purple reflections; a spot of dense golden pile in the upper portion of the sternopleuron; pubescence scanty, golden, a small tuft extending back from the mesopleuron; and a loose patch of pubescence on the upper mesepimeron. Abdomen with first visible segment bright metallic golden-green, duller at base, densely clothed with long bright golden pubescence; second segment metallic purple at base, the band of colour narrow in midline extending back on each side to beyond middle and densely clothed with bright gold pubescence, the rest of the segment black and clothed with dense black appressed pubescence; third segment dark metallic green with purple reflections, with black pubescence except for a broad apical band of dense golden pubescence extending forward on each side; fourth segment deep metallic green with black pubescence in centre and golden pubscence on each side; venter black with pale segmentations, the sternites with metallic reflections. Anterior and middle femora brown with purple reflections, the apices yellow; anterior tibiae yellow in basal, brown in apical half, anterior tarsi brown, the apical two joints pale yellow, the claws tipped with black; intermediate tibiae and tarsi all yellow; posterior femora very stout with a subapical ventral protuberance, more or less concealed by dense black pubescence, reddish-brown with purplish and greenish reflections, the under surface more violet and a deep violet patch in apical third on each side of ventral surface, pubescence black, the upper border with dense golden pubescence for basal two-thirds of length, the golden pubescence extending

CRIORRHINA MULTICOLOR, n. sp.

♂, ♀. Head as wide as thorax; front narrow in ♂, about five times as long as width at vertex, slightly narrowed in middle, thence widened out to antennal tubercle; slightly broader in ♀ at vertex, thence evenly and considerably widened anteriorly; densely clothed with bright golden tomentum with rather sparse golden hairs; ocellary triangle dark brown; antennal tubercle slightly produced, dark reddish-brown, densely clothed at base and sides with bright golden tomentum, somewhat lighter in colour than on front, the tomentum extending further on the tubercle in the ♂ than in the ♀; face with similar golden clothing, parafacials also densely clothed, appearing golden when viewed from in front, but brown when seen from side, the snout slightly produced, with a single slightly emarginate tubercle above and a more acute one on each side at free margin, the lateral portions below the parafacialia destitute of clothing, laevigate and of a deep violet-blue colour; cheeks small, clothed with dark grey tomentum; the occipital region with similar clothing. Antennae dark brown, almost black; first joint short, subcylindrical, second the length of first, but widened at apex, and laterally compressed, third joint broad, reniform, the arista dark brown, situated near base. Eyes bare.

Mesonotum iridescent green with purple reflections, with a pair of rather narrow median lines of deep black extending from anterior margin across suture to opposite wing roots, slightly divergent posteriorly, also with a similar dorsocentral black vitta on each side, broad in front, but narrowing to a point posteriorly and extending to posterior margin, these vittae clothed with dense black pile; the humeral angle and lateral margin as far as wing root reddish-brown, the prominences clothed with bright golden pile; suture reddish-brown, not extending across midline; an oblong spot of golden tomentum on each side between humeral prominence and midline; pubescence light brown becoming black posteriorly, rather sparse, denser and bright golden on humeral and lateral prominences. Scutellum light yellow, becoming purplish-brown at the lateral corners, clothed with yellow pubescence. Pleural segments dark brown to black, for the most part dull, but mesopleuron with metallic greenish and purple reflections; a spot of dense golden pile in the upper portion of the sternopleuron; pubescence scanty, golden, a small tuft extending back from the mesopleuron; and a loose patch of pubescence on the upper mesepimeron. Abdomen with first visible segment bright metallic golden-green, duller at base, densely clothed with long bright golden pubescence; second segment metallic purple at base, the band of colour narrow in midline extending back on each side to beyond middle and densely clothed with bright gold pubescence, the rest of the segment black and clothed with dense black appressed pubescence; third segment dark metallic green with purple reflections, with black pubescence except for a broad apical band of dense golden pubescence extending forward on each side; fourth segment deep metallic green with black pubescence in centre and golden pubscence on each side; venter black with pale segmentations, the sternites with metallic reflections. Anterior and middle femora brown with purple reflections, the apices yellow; anterior tibiae yellow in basal, brown in apical half, anterior tarsi brown, the apical two joints pale yellow, the claws tipped with black; intermediate tibiae and tarsi all yellow; posterior femora very stout with a subapical ventral protuberance, more or less concealed by dense black pubescence, reddish-brown with purplish and greenish reflections, the under surface more violet and a deep violet patch in apical third on each side of ventral surface, pubescence black, the upper border with dense golden pubescence for basal two-thirds of length, the golden pubescence extending on to upper portion of anterior surface; posterior tibiae strongly curved and somewhat thickened in apical third, yellow in basal half, reddish-brown in apical becoming darker at apex, with golden pubescence on basal half, black on apical; posterior tarsi with three basal segments dark brown with black pubescence and two apical segments yellow with golden pubescence, claws tipped with black. Wings with a broad band of brown along the anterior margin from base to apex where it is somewhat wider; venation as in *C. nudiventris*, but prolongation of 1 An. longer than in that species; *vena spuria* well marked. Calypters white with dark margin; halteres yellow.

Length, ♂ 14·5 mm.; ♀ 15 mm.

Holotype ♂, Eccleston (J. Hopson), 1.3.21; allotype ♀, Dorrigo (W. Heron); paratype ♀, Bunya Mts., Queensland (E. J. Dumigan).

The holotype was found by Mr. J. Hopson in the scrub at the head of the Allyn River, and the allotype was forwarded to the South Australian Museum by Mr. Heron of Dorrigo; the species appears to have a wide distribution along the highlands of the north coast of New South Wales, into Queensland.

The species agrees well in generic characters with *Criorrhina nudiventris* Macq., but differs entirely in the scheme of coloration. Holotype presented to Australian Museum, allotype in South Australian Museum.

CRIORRHINA HACKERI, n. sp.

A moderate sized yellow species with black lines on mesonotum, and black abdomen with yellow markings at base.

♀. Head yellow, front densely clothed with golden yellow tomentum, except on midline, which is linearly impressed, also with long golden pubescence, ocellary and vertical regions dark brown with long golden hairs, sides of front diverging anteriorly, at vertex about one-seventh, at base of antennal prominence a little less than two-fifths the head width, produced in front to a prominent conical antennal protuberance, which is pale yellowish-brown or testaceous, laevigate; face descending downwards and backwards from base of antennae, then produced forwards to oral margin, median knob absent, oral margin obliquely cut away at apex, not tuberculate, but feebly bifurcate with a moderately prominent projection on each side; the face densely golden tomentose except on median line and on ventral sides which are blackish; cheeks black, mostly bare, some greyish tomentum posteriorly; occiput with dense greyish-yellow tomentum and some pale pubescence on posterior orbits. Antennae short, the two basal segments yellowish-brown, the third black, subreniform, higher than long; arista long. Mesonotum yellow, densely clothed with yellow and bearing four black vittae, the two median vittae close together, narrow, mainly parallel, but convergent anteriorly and slightly thickened posteriorly, ending about midway between suture and scutellum; lateral vittae broken into two by the transverse suture, the anterior portion oval, obliquely-truncate posteriorly, the posterior portion elongate, tear-shaped, ending in a long point not quite reaching posterior margin, the vittae clothed with black tomentum; pubescence yellow, longer at sides and on postero-lateral ridge. Scutellum golden yellow with pale pubescent hairs, trapezoidal in shape, the lateroapical angles distinctly flanged. Pleural segments brown, mainly clothed with greyish tomentum, varying to brown around the periphery of the segments, pubescence pale; sternal segments black with grey pubescence.

Abdomen black, shiny, first segment brown with black apical band expanding at sides; second segment with a reddish-yellow mark on each side of base, not on to upper portion of anterior surface; posterior tibiae strongly curved and somewhat thickened in apical third, yellow in basal half, reddish-brown in apical becoming darker at apex, with golden pubescence on basal half, black on apical; posterior tarsi with three basal segments dark brown with black pubescence and two apical segments yellow with golden pubescence, claws tipped with black. Wings with a broad band of brown along the anterior margin from base to apex where it is somewhat wider; venation as in *C. nudiventris*, but prolongation of 1 An. longer than in that species; *vena spuria* well marked. Calypters white with dark margin; halteres yellow.

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♀. Head yellow, front densely clothed with golden yellow tomentum, except on midline, which is linearly impressed, also with long golden pubescence, ocellary and vertical regions dark brown with long golden hairs, sides of front diverging anteriorly, at vertex about one-seventh, at base of antennal prominence a little less than two-fifths the head width, produced in front to a prominent conical antennal protuberance, which is pale yellowish-brown or testaceous, laevigate; face descending downwards and backwards from base of antennae, then produced forwards to oral margin, median knob absent, oral margin obliquely cut away at apex, not tuberculate, but feebly bifurcate with a moderately prominent projection on each side; the face densely golden tomentose except on median line and on ventral sides which are blackish; cheeks black, mostly bare, some greyish tomentum posteriorly; occiput with dense greyish-yellow tomentum and some pale pubescence on posterior orbits. Antennae short, the two basal segments yellowish-brown, the third black, subreniform, higher than long; arista long. Mesonotum yellow, densely clothed with yellow and bearing four black vittae, the two median vittae close together, narrow, mainly parallel, but convergent anteriorly and slightly thickened posteriorly, ending about midway between suture and scutellum; lateral vittae broken into two by the transverse suture, the anterior portion oval, obliquely-truncate posteriorly, the posterior portion elongate, tear-shaped, ending in a long point not quite reaching posterior margin, the vittae clothed with black tomentum; pubescence yellow, longer at sides and on postero-lateral ridge. Scutellum golden yellow with pale pubescent hairs, trapezoidal in shape, the lateroapical angles distinctly flanged. Pleural segments brown, mainly clothed with greyish tomentum, varying to brown around the periphery of the segments, pubescence pale; sternal segments black with grey pubescence.

Abdomen black, shiny, first segment brown with black apical band expanding at sides; second segment with a reddish-yellow mark on each side of base, not meeting in midline, expanding laterally and continued along the lateral margin on to third segment, third segment with reddish-yellow mark on lateral margin extending from base, where it is somewhat wider, to the posterior quarter of the side; pubescence mainly dark, short and appressed, longer and yellow on the pale areas, some yellow hairs across middle of third segment and on each side of middle of fourth segment, lateral pubescence yellow from base to middle of fourth segment, thence black, longer at the base of second segment. Venter black, the second segment brownish, membranes connecting tergites and sternites grey, with a broad black patch opposite each segment. Legs clear yellow, the coxae, trochanters and apical third of posterior femora black, posterior tarsi, except tip of each segment and extreme tip of posterior tibiae, infuscate, the tarsi with golden pubescence beneath; posterior femora rather feebly thickened, with pale pubescence on basal two-thirds, black on apical, some closely set stiff bristles on under surface near apex. Wings grey suffused with brown across wing from tip of *Sc* to base of median cell, and along longitudinal veins especially marked at apex; this dark colour mainly due to fine microscopic pubescence. Venation as in genus, R_{4+5} rather strongly upturned at apex, *r-m* very oblique, situated well beyond middle of median cell, 1st Anal continued on beyond junction with Cu_1. Calypters yellow with yellow fringe; halteres reddish-yellow.

Length, 13 mm.

Hab.—Queensland: National Pk. (H. Hacker, December, 1921).

Described from a single female in the Queensland Museum. The species is most nearly allied to *C. multicolor*, but has entirely different coloration.

CRIORRHINA NUDIVENTRIS Macq.

Criorrhina nudiventris Macquart, 1846, p. 126, Pl. ii, fig. 9.—*Deineches nigrofulva* Walker, 1852, p. 228, Pl. 6, f. 7; Hardy, 1921, p. 18, Pl. 1, f. 3.

I believe from comparison of the descriptions and figures that the above synonymy is correct. Hardy failed to recognize Macquart's species, merely stating, "Under the name *Criorrhina nudiventris*, Macquart has described a species that probably does not belong to this genus". The name is attached to specimens in the National Museum, Melbourne, which are certainly the same as *Deineches nigrofulva* Walker, though I do not know by whom the determination was made.

I have already discussed my reasons for following Brunetti in sinking *Deineches* under *Criorrhina*, and a study of other Australian members of *Criorrhina* has confirmed me in the opinion that they are generically inseparable from one another, though differing in the characters of the contiguous or non-contiguous eyes and in the course of the 1st anal vein.

The present species is a very striking bright fulvous insect with the apical two-thirds of the abdomen black. It is closest in general appearance to *C. fulva*, n. sp., but that species has the eyes separate in the male.

Hab.—Victoria, Tasmania, New South Wales.

The species appears to be moderately common in the southern part of the continent. Hardy records it from New South Wales only, but most of the specimens I have seen were from Victoria or Tasmania; three specimens from Tasmania are in the South Australian Museum; they were taken at Hobart, Beaconsfield and Launceston. In New South Wales the species has not been recorded from north of the neighbourhood of Sydney. Mr. Froggatt has a specimen taken at Cordeaux Dam.

meeting in midline, expanding laterally and continued along the lateral margin on to third segment, third segment with reddish-yellow mark on lateral margin extending from base, where it is somewhat wider, to the posterior quarter of the side; pubescence mainly dark, short and appressed, longer and yellow on the pale areas, some yellow hairs across middle of third segment and on each side of middle of fourth segment, lateral pubescence yellow from base to middle of fourth segment, thence black, longer at the base of second segment. Venter black, the second segment brownish, membranes connecting tergites and sternites grey, with a broad black patch opposite each segment. Legs clear yellow, the coxae, trochanters and apical third of posterior femora black, posterior tarsi, except tip of each segment and extreme tip of posterior tibiae, infuscate, the tarsi with golden pubescence beneath; posterior femora rather feebly thickened, with pale pubescence on basal two-thirds, black on apical, some closely set stiff bristles on under surface near apex. Wings grey suffused with brown across wing from tip of *Sc* to base of median cell, and along longitudinal veins especially marked at apex; this dark colour mainly due to fine microscopic pubescence. Venation as in genus, R_{4+5} rather strongly upturned at apex, *r-m* very oblique, situated well beyond middle of median cell, 1st Anal continued on beyond junction with Cu_1. Calypters yellow with yellow fringe; halteres reddish-yellow.

Length, 13 mm.

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CRIORRHINA FULVA, n. sp.

A large reddish-brown species allied to *C. nudiventris* Macq.

♂. Eyes separated by one-eighth of head width at vertex and by approximately one-thirteenth at narrowest part anteriorly; ocellary region dark brown with fulvous hairs, small area in front of ocelli at narrowest part of front densely clothed with pale yellow tomentum; frontal triangle rather strongly produced, densely clothed with pale yellow tomentum with some pale yellow hairs, lunule brown, bare; face slightly retreating below antenna thence produced to oral margin with a well marked median knob, pale yellow, the median knob brown, vertical sides dark brown, upper portion of face with pale yellow tomentum continuous with tomentum of antennal tubercle, rest of face laevigate; oral margin produced obliquely downwards and forwards, the lower edge with a prominent projection on each side before apex; cheeks and mid-posterior orbits densely grey tomentose with grey pubescence. Antennae reddish-brown, third joint deeper than long, arista basal, dark brown. Mesonotum black, covered with grey tomentum, and with rather dense long yellow pubescence, humeral angle and posterolateral ridges reddish-brown. Scutellum reddish-brown with long dense yellow pubescence, apical margin rounded, with a somewhat obscure subapical transverse impression. Pleurae mainly black, yellowish-brown on mesopleuron, grey tomentose and with long pale yellow pubescence.

Abdomen reddish-fulvous with similarly coloured short depressed hairs, longer pale yellow pubescence present at sides, longest on second segment. Venter reddish-fulvous.

Legs reddish-fulvous with the tips of claws black, pubescence mainly pale yellow, but some short black setae present on undersurface of posterior femora; posterior femora greatly thickened and widened, ventral surface with a short obtuse subapical tubercle, posterior tibiae strongly bowed, a slight projection present on undersurface near base. Wings pale grey; venation as in *C. nudiventris*.

Length, 15 mm.

Hab.—South Australia, a single specimen in the Macleay Museum.

Described from a somewhat damaged specimen which yet appears sufficiently distinct to merit description. The species is allied to *C. nudiventris*, but differs in its generally paler colour, the concolorous abdomen, and in the dichoptic eyes: in *C. nudiventris* the eyes come together at a point anteriorly.

CRIORRHINA RUFOCAUDATA, n. sp.

A black species with reddish-orange apex to abdomen.

♀. Head black; front approximately one-eighth the head width at vertex, widening to about two-sevenths head width anteriorly; antennal prominence not very strongly marked, black, a band of golden tomentum across front at base of antennal prominence, sides of prominence with grey tomentum, pubescence golden yellow; face produced downwards and forwards from base of antennae to a low and rather inconspicuous central knob, thence to oral margin, black, densely clothed with grey tomentum, except on a bare triangular area on each side of mid-line and on the vertical sides; oral margins strongly cut away at apex with a prominent projection on each side; posterior orbits with silvery grey tomentum and pubescence. Antennae reddish-brown, the basal joints with whitish hairs above; third joint subovate, somewhat deeper than long, arista reddish-brown at base, becoming darker towards apex. Thorax black with obscure grey pruinescence forming two macules on each side along anterior margin, a pair of median

CRIORRHINA FULVA, n. sp.

A large reddish-brown species allied to *C. nudiventris* Macq.

♂. Eyes separated by one-eighth of head width at vertex and by approximately one-thirteenth at narrowest part anteriorly; ocellary region dark brown with fulvous hairs, small area in front of ocelli at narrowest part of front densely clothed with pale yellow tomentum; frontal triangle rather strongly produced, densely clothed with pale yellow tomentum with some pale yellow hairs, lunule brown, bare; face slightly retreating below antenna thence produced to oral margin with a well marked median knob, pale yellow, the median knob brown, vertical sides dark brown, upper portion of face with pale yellow tomentum continuous with tomentum of antennal tubercle, rest of face laevigate; oral margin produced obliquely downwards and forwards, the lower edge with a prominent projection on each side before apex; cheeks and mid-posterior orbits densely grey tomentose with grey pubescence. Antennae reddish-brown, third joint deeper than long, arista basal, dark brown. Mesonotum black, covered with grey tomentum, and with rather dense long yellow pubescence, humeral angle and posterolateral ridges reddish-brown. Scutellum reddish-brown with long dense yellow pubescence, apical margin rounded, with a somewhat obscure subapical transverse impression. Pleurae mainly black, yellowish-brown on mesopleuron, grey tomentose and with long pale yellow pubescence.

Abdomen reddish-fulvous with similarly coloured short depressed hairs, longer pale yellow pubescence present at sides, longest on second segment. Venter reddish-fulvous.

Legs reddish-fulvous with the tips of claws black, pubescence mainly pale yellow, but some short black setae present on undersurface of posterior femora; posterior femora greatly thickened and widened, ventral surface with a short obtuse subapical tubercle, posterior tibiae strongly bowed, a slight projection present on undersurface near base. Wings pale grey; venation as in *C. nudiventris*.

Length, 15 mm.

Hab.—South Australia, a single specimen in the Macleay Museum.

Described from a somewhat damaged specimen which yet appears sufficiently distinct to merit description. The species is allied to *C. nudiventris*, but differs in its generally paler colour, the concolorous abdomen, and in the dichoptic eyes: in *C. nudiventris* the eyes come together at a point anteriorly.

CRIORRHINA RUFOCAUDATA, n. sp.

A black species with reddish-orange apex to abdomen.

♀. Head black; front approximately one-eighth the head width at vertex, widening to about two-sevenths head width anteriorly; antennal prominence not very strongly marked, black, a band of golden tomentum across front at base of antennal prominence, sides of prominence with grey tomentum, pubescence golden yellow; face produced downwards and forwards from base of antennae to a low and rather inconspicuous central knob, thence to oral margin, black, densely clothed with grey tomentum, except on a bare triangular area on each side of mid-line and on the vertical sides; oral margins strongly cut away at apex with a prominent projection on each side; posterior orbits with silvery grey tomentum and pubescence. Antennae reddish-brown, the basal joints with whitish hairs above; third joint subovate, somewhat deeper than long, arista reddish-brown at base, becoming darker towards apex. Thorax black with obscure grey pruinescence forming two macules on each side along anterior margin, a pair of median longitudinal vittae, and irregularly clothing posterolateral and posterior margins; suture grey tomentose; pubescence arising from small discrete granules, mainly dark with some grey hairs intermingled, along sides, and posteriorly longer and white. Scutellum distinctly transverse, convex, blackish-brown with a whitish flange-like apical border, the whole with long white pubescence. Pleurae black, grey pruinescent, pubescence grey to white. Abdomen black, the apical half of fourth segment broadly orange in middle, narrowed at sides, this portion clothed with reddish-orange recumbent pubescence, fifth segment retracted, reddish-orange; pubescence elsewhere black appressed with white pubescence at latero-basal angles, longer white silvery pubescence present at sides of second segment. Venter black. Legs black; anterior tarsi whitish, the metatarsus and second joint somewhat infuscate and showing black except at apex on under surface, a black patch also present on apical joint at base of claws; intermediate tarsi entirely whitish-yellow, posterior tarsi reddish-yellow; posterior femora greatly incrassate with a subapical flange-like projection from anteroventral border, tibiae strongly bowed; a fringe of dense black hairs along posteroventral border of posterior femora, pubescence elsewhere white. Wings greyish, microscopically pubescent, the longitudinal veins suffused with brown in outer half of wing. Calypters white with brown border and greyish fringe. Halteres pale yellow.

Length, 14 mm.

Hab.—N. S. Wales: Barrington Tops, 13-17 December, 1921 (G. Goldfinch).

In this species the course of 1st anal vein is directly continued to the wing margin. The species is, however, so closely allied to *Criorrhina nudiventris* in the structure of the face and posterior femora that I do not think it should be generically separated.

CRIORRHINA SPADIX Hardy.

Criorrhina spadix Hardy, 1921, p. 17, Pl. 1, fig. 5, 6 and 7.

The holotype of this species has been lodged by Hardy in the Australian Museum. The species is thoroughly distinct from the remaining members of the genus in Australia and should be readily recognized from the description and figure given by Hardy.

Hab.—Tasmania: Hobart (Hardy 1.2.17).

As the male only was known to Hardy, the following description of the female is given.

♀. Agrees with male in general coloration and characters; differs as follows: Eyes widely separated, the front evenly widened from ocellary region to antennal tubercle; central knob of face barely indicated, the whole front and face without golden tomentum, a little greyish tomentum along orbits, and on vertical sides of snout; posterior femora slender, not swollen, posterior tibiae only slightly bowed.

Length, 13 mm.

Described from a female labelled Tyenna, 12.12.17, C. E. Cole, in the National Museum, Melbourne, which had been identified by Hardy as this species. A second female from Magnet, Tasmania (Lea), is in my own collection.

The wings are described by Hardy as "brown along the anterior border, otherwise they are more or less hyaline and yellow at the base". In the females the brown colour is expanded in the middle along the cross-veins and the veins at the apex of the wing are also suffused with brown.

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SYRITTA.

Syritta St. Fargeau Serville, 1825, p. 888.—(For other synonymy see Brunetti, 1923, p. 244).

Closely allied to *Xylota*, distinguished by *r-m* cross-vein which is placed at the middle of the discal cell and upright. Face with a central keel. Second segment of abdomen projecting back at sides, bearing a peculiar fringe of hairs at its most produced portion. Hind femora extremely incrassated, with short rigid spines beneath. (Brunetti, somewhat modified).

Two Australian species have been referred to this genus; in one case the species appears to be a native form; in the other case, an Oriental one whose range embraces Australia.

The Oriental species are apparently very variable and it seems doubtful from Brunetti's remarks whether they should not all be referred to but one species. The endemic Australian form (*S. hackeri*) certainly appears distinct from the Oriental species.

Life history.—*S. hackeri* has been bred from rotten banana stems; the other species probably also breed in rotting fruit and other vegetable refuse. *S. pipiens* L. lives in horse or cow dung (Brunetti, *l.c.*, p. 244).

The two species found in Australia may be distinguished as follows:

Size larger (11·5 mm.); pale markings on head and thorax bright yellow; with projection on under surface of hind tibiae .... *S. hackeri* Klocker
Size smaller (8 mm.); pale markings on head and thorax greyish-white; with hind tibiae evenly curved, without projection on ventral surface ...... *S. orientalis* Macq.

SYRITTA HACKERI Klocker.

Syritta hackeri Klocker, 1921, p. 59, Pl. x, fig. 4.

The ♂ only was known to Klocker; several specimens of both sexes are before me and show some difference in colouring and structure of the legs. In the female the posterior femora are black in colour, while the posterior tibiae practically entirely lack the flange-like projection from the ventral surface, which is present in the ♂ and well shown in Klocker's figure.

The species has been bred by the Agricultural Department from larvae found in rotting banana stems on the Tweed River.

Hab.—Queensland: Brisbane. New South Wales: Wollongbar.

*SYRITTA ORIENTALIS Macq.

Syritta orientalis Macq., 1842, p. 76.—*S. illucida*, Walker, 1860, p. 121. (For other synonymy see Brunetti, 1923, p. 246).

Klocker (1921, p. 60) records with some doubt the presence of this species in Australia under the name of *S. illucida* Walk. Brunetti (1923, p. 249 and footnote) sinks *S. illucida* as a synonym of *S. orientalis* from an examination of Walker's type.

The species is apparently variable in the coloration of both abdomen and posterior femora and the short series before me shows variation in these respects. Brunetti's description and remarks should be consulted as to these variations and as to the question of the distinction between this species and *L. pipiens* L.

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* Australian specimens are stated by Dr. G. A. K. Marshall to differ from both *S. orientalis* and *S. pipiens* in the unusual markings on the second abdominal segment and in the leg coloration. As the species varies in the colour of these parts in different specimens I prefer not to describe it as new at present.

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All the specimens before me are decidedly smaller than those of *S. hackeri* and the yellow patches of the latter are more whitish in *S. orientalis*. The ♂ has the posterior tibiae simple.

Hab.—Queensland: Brisbane, Eidsvold, Gordonvale.

A specimen from Darwin, Northern Territory, probably represents a distinct species; it is smaller (5 mm.) and the posterior femora are less thickened, somewhat differently shaped and with a more conspicuous basal ventral tooth; the veins in the wings are pale. This last character suggests *S. luteinevris* de Meijere, but the smaller size and the dark brown, not black, posterior femora preclude me from identifying it with de Meijere's species in the absence of any details of the structure of the posterior femora.

XYLOTA.

For synonymy see Brunetti, 1923, p. 231.

Head generally slightly broader than thorax, eyes bare, contiguous in male, widely separated in female; face hollowed below the moderate antennal prominence, upper mouth edge distinctly produced, central knob absent; antennae with third joint rather large, round or oval, arista bare, subbasal. Thorax oblong, fairly arched; scutellum concolorous; both fairly pubescent. Abdomen narrow and much longer than thorax, rather flat, with nearly parallel sides. Legs strong, hind femora more or less thickened or lengthened, generally serrulate below, hind trochanters of male often with a process or spine below, hind tibiae more or less curved, sometimes ending in a distinct spur. Wings with the venation of the Milesiinae; cell R open; R_{4+5} nearly straight; *r-m* at or beyond middle of median cell, very oblique.

The above diagnosis, slightly modified from Brunetti, covers the Australian species, except that a facial knob is present in the male only of *X. illucens*, n. sp. The femoral structure varies somewhat in the different species; the hind femora are stout in *X. pleuralis* Kertesz and *X. victoriensis*, n. sp., and long and slender in *X. iridescens*, n. sp. The other two species are intermediate, in *X. flavitarsis* Macq. the posterior femora approximate to those of *X. pleuralis* and in *X. illucens* to those of *X. iridescens*.

Two Australian species have previously been placed in this genus. I propose to place here three additional species, two of them with a somewhat different facies from the other two, but apparently, from description, approximating to certain Indian species.

Distribution.—The genus is known only from the eastern portion of the continent. *X. pleuralis* occurs in Queensland and New South Wales. *X. victoriensis* is its representative in Victoria; *X. flavitarsis* appears to be most common in Victoria, but extends into New South Wales; *X. illucens* is known from New South Wales and Victoria, while *X. iridescens* is described from a single specimen from New South Wales.

Table of Species.

1. Dark species with thickened hind femora 2
   Yellowish species with comparatively slender hind femora 4
2. Thorax black, non-metallic, legs black, tarsi white .... *X. flavitarsis* Macq.
   Thorax metallic 3
3. Thorax brassy green with a prescutellar patch of golden pubescence, and golden pubescence on pleura; posterior femora all black .... *X. pleuralis* Kertesz.
   Thorax without pubescent patches, posterior femora ringed at base .... *X. victoriensis*, n. sp.

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4. Thorax with golden tomentose stripes, abdomen with large translucent patch on each side of 2nd and 3rd segments .... *X. illucens,* n. sp.
Thorax with golden tomentose spots; abdomen with only a small yellow spot on each side on the second and third segments .... *X. iridescens,* n. sp.

XYLOTA PLEURALIS Kertesz.

Xylota pleuralis Kertesz, 1901, p. 413; *id., Hardy,* 1921, p. 17.

Specimens agreeing with Kertesz's description are before me from Eccleston, New South Wales and Queensland.

The species is readily distinguished by the brassy green thorax with its dense bright golden pubescence and the similar patch of pubescence on the mesopleuron. There is no spinous process on the hind trochanters.

In a female from Brisbane, the eyes are separated by one-eighth of the head width and the front is black; the golden pubescent tufts are present on the dorsum and pleura and the posterior femora are black.

Hab.—N. S. Wales: Eccleston, Pt. Macquarie. Queensland: Brisbane, National Park.

XYLOTA FLAVITARSIS Macq.

Xylota flavitarsis Macquart, 1846, p. 134; *id.*, 1850, p. 146; *id.*, Hardy, 1921, p. 17.

The general dull black coloration and the pale creamy tarsi render this species readily recognizable. In the ♂ there is a long curved rod-like process arising from the under surface of the hind trochanters.

Hardy (*l.c.*) records this species from Tasmania and Victoria. Several specimens are before me from various localities in the latter State, and from the Blue Mountains, Eccleston and Toronto in New South Wales.

Hab.—Tasmania, Victoria, New South Wales.

XYLOTA VICTORIENSIS, n. sp.

A black species with brassy green thorax; allied to *X. pleuralis* Kertesz, but without pleural pubescence.

♀. Head black, front about one-fifth of head width at vertex, widening to approximately one-third of head width anteriorly, black, shining, with some sparse dark hairs, grey at sides anteriorly and brownish on vertex, antennal protuberance moderately prominent; face slightly retreating beneath antennae, thence produced to oral margin, the latter obliquely cut away at apex with a small projection on each side, densely clothed with pale yellow tomentum, vertical sides and cheeks black, some scanty grey hairs on cheeks and posterior orbits; antennae blackish-brown, third joint about as deep as long, arista basal, longer than joint.

Mesonotum brassy green, metallic, moderately densely clothed with a rather short erect golden pile; the humeral angles and posterolateral ridges black with faint blue sheen. Scutellum similar to mesonotum, but with only some scanty yellowish hairs. Pleurae black, with some scanty grey pubescence.

Abdomen black, with short black pubescence; some scanty white hairs on each side near base on third and fourth segments; lateral hairs whitish, longest at base of second segment. Venter black. Legs blackish-brown, anterior leg with extreme base of femora brownish and the extreme apex of femora and basal third of tibiae yellow, anterior tarsi pale brown, lighter beneath, the apex darker, intermediate legs similar but the yellow about knees is yellow-brown and less extensive; tarsal joint almost whitish with dark tips, the two apical joints dark; posterior femora strongly incrassate with some spinose setae along lower surface,

4. Thorax with golden tomentose stripes, abdomen with large translucent patch on each side of 2nd and 3rd segments .... *X. illucens*, n. sp.
Thorax with golden tomentose spots; abdomen with only a small yellow spot on each side on the second and third segments .... *X. iridescens*, n. sp.

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Length, 9 mm.

Hab.—Victoria: Bendigo (L. B. Thorn). A single female in the National Museum, Melbourne.

While closely allied to *X. pleuralis* Kert., the present species differs in the absence of the golden pubescent prescutellar and pleural tufts, and in the banding on the posterior femora. The front is also wider than is the case in the female of *X. pleuralis* Kert.

XYLOTA ILLUCENS, n. sp.

A black and yellow species with striped thorax, and iridescent abdomen.

♂. Head testaceous yellow; eyes meeting for about one-sixth of distance from vertex to base of antennae, vertex and ocellary triangle black with long yellow pubescence, a small narrow triangle in front of ocelli golden tomentose; frontal triangle rather strongly produced, densely clothed with golden tomentum; face moderately strongly produced downwards, retreating below antennae, thence produced to oral margin with a marked central knob or hump, oral margin with a prominent projection on each side, densely yellow tomentose, except on midline and on vertical sides, the tomentum extending across middle line above the hump; general colour testaceous with a dark almost blackish mark on vertical sides near eye border; cheeks with scanty grey tomentum and some straggling grey pubescence; posterior orbits grey tomentose with fine scanty grey pubescence; eyes bare, equally faceted; antennae light reddish-brown, short, the third joint briefly ovate, arista long, dorsal, subbasal, bare. Mesonotum black with a rather narrow golden tomentose vitta on each side of the broad black median line; these vittae are divergent posteriorly, a second vitta on each side along lateral margin, only golden tomentose in front of suture, elsewhere more reddish-brown, a golden tomentose band connecting the vittae on each side and extending over humeral callus, but not crossing midline; pubescence rather scanty, long yellow; some longer yellow hairs present on posterolateral ridge; scutellum reddish-brown, lighter at apex, apical margin rounded with a narrow flattened border; pubescence long, scanty, yellow. Pleural segments mainly black, in places brownish, and feebly iridescent, with a prominent golden tomentose patch on mesopleuron and a smaller one on sternopleuron; pubescence scanty, yellow.

Abdomen elongate, distinctly narrower than mesonotum, flat, practically parallel-sided; first segment testaceous, second segment yellow testaceous with a dark brown broad median vitta gradually widening out from middle to embrace entire hind margin, lateral borders also dark brown; third segment shorter, similar, but yellow reduced to smaller patch on each side, extending slightly beyond middle, on both segments the yellow areas are translucent, practically transparent, and in certain lights iridescent, the brown lateral margins are markedly purple iridescent; fourth segment bluish-black, slightly iridescent, diluted with red along lateral margins and apex, the junction between the colours ill-defined, genital segments reddish-brown; pubescence short, scanty, dark brown, but yellow on the yellow areas; longer yellow pubescence present on sides of second segment. Venter yellow, translucent at base, black at apex.

Legs moderately long, light reddish-brown, coxae black, trochanters dark brown, the posterior black, apex of posterior tibiae with ill-defined blackish staining, pubescence short, yellow; posterior coxae with a short tooth on inner black with broad bright yellow band at extreme base, posterior tibiae bowed, tarsi dark brown. Wings hyaline, very slightly suffused with grey towards apex; venation as in genus.

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XYLOTA ILLUCENS, n. sp.

A black and yellow species with striped thorax, and iridescent abdomen.

♂. Head testaceous yellow; eyes meeting for about one-sixth of distance from vertex to base of antennae, vertex and ocellary triangle black with long yellow pubescence, a small narrow triangle in front of ocelli golden tomentose; frontal triangle rather strongly produced, densely clothed with golden tomentum; face moderately strongly produced downwards, retreating below antennae, thence produced to oral margin with a marked central knob or hump, oral margin with a prominent projection on each side, densely yellow tomentose, except on midline and on vertical sides, the tomentum extending across middle line above the hump; general colour testaceous with a dark almost blackish mark on vertical sides near eye border; cheeks with scanty grey tomentum and some straggling grey pubescence; posterior orbits grey tomentose with fine scanty grey pubescence; eyes bare, equally faceted; antennae light reddish-brown, short, the third joint briefly ovate, arista long, dorsal, subbasal, bare. Mesonotum black with a rather narrow golden tomentose vitta on each side of the broad black median line; these vittae are divergent posteriorly, a second vitta on each side along lateral margin, only golden tomentose in front of suture, elsewhere more reddish-brown, a golden tomentose band connecting the vittae on each side and extending over humeral callus, but not crossing midline; pubescence rather scanty, long yellow; some longer yellow hairs present on posterolateral ridge; scutellum reddish-brown, lighter at apex, apical margin rounded with a narrow flattened border; pubescence long, scanty, yellow. Pleural segments mainly black, in places brownish, and feebly iridescent, with a prominent golden tomentose patch on mesopleuron and a smaller one on sternopleuron; pubescence scanty, yellow.

Abdomen elongate, distinctly narrower than mesonotum, flat, practically parallel-sided; first segment testaceous, second segment yellow testaceous with a dark brown broad median vitta gradually widening out from middle to embrace entire hind margin, lateral borders also dark brown; third segment shorter, similar, but yellow reduced to smaller patch on each side, extending slightly beyond middle, on both segments the yellow areas are translucent, practically transparent, and in certain lights iridescent, the brown lateral margins are markedly purple iridescent; fourth segment bluish-black, slightly iridescent, diluted with red along lateral margins and apex, the junction between the colours ill-defined, genital segments reddish-brown; pubescence short, scanty, dark brown, but yellow on the yellow areas; longer yellow pubescence present on sides of second segment. Venter yellow, translucent at base, black at apex.

Legs moderately long, light reddish-brown, coxae black, trochanters dark brown, the posterior black, apex of posterior tibiae with ill-defined blackish staining, pubescence short, yellow; posterior coxae with a short tooth on inner posterior angle, posterior trochanters triangularly produced at apex; posterior femora slightly thickened with a group of black spinose setae on each side of ventral surface near apex; posterior tarsi feebly curved. Wings hyaline, the costal cell and extreme base pale yellow, a faint ill-defined brownish mark in anterior portion opposite inner end of median cell, a larger ill-defined faint brownish patch at apex, including greater portion of cell R_5; *r-m* very long and oblique, reaching *m-c* well beyond the middle; cell R_5 closed on wing margin. Calypters golden with golden fringe; halteres yellow.

♀ agrees with ♂; eyes separated; forehead with sides divergent anteriorly, at narrowest part about one-eighth total head width, black round ocelli, golden tomentose, except for a narrow median black line and the prominent laevigate reddish-brown antennal tubercle, the golden tomentum on face reduced to a short line at base on each side continuous along the orbits with golden tomentum of front; face without central hump. Abdomen rather broader.

Length, 13 mm.

Hab.—Victoria: Narracan (1-96, W.K., type and allotype). New South Wales: Barrington Tops, Feb., 1925 (University Zoological Expedition), two ♀ paratypes.

The Barrington Tops specimens have the dark wing markings somewhat more distinct, otherwise they do not differ from the Victorian specimens.

The species is, in coloration, quite unlike any other known Australian species and possibly is not ascribed to the correct genus. I fail to find characters—apart from coloration—that warrant generic separation, unless the presence of a central facial hump in the male is to be regarded as of generic importance. The species, judging from descriptions, most resembles certain Indian species placed by Brunetti under *Xylota.*

XYLOTA IRIDESCENS, n. sp.

A rather slender, reddish-brown, iridescent species, with pale tomentose spots on mesonotum and abdomen.

♀. Head yellow or reddish-brown; eyes separated by about one-sixth of head width, in narrowest part, front once and one-half times as wide anteriorly as at vertex, produced forwards into a strong conical projection, yellowish-brown, the vertex lighter, a median line and the antennal protuberance reddish-brown, pubescence scanty, yellowish-brown, a pair of golden tomentose spots in front of ocelli, a large pair at base of antennal protuberance extending along orbits on to sides of protuberance; face retreating below the antennae, then produced forwards to oral margin, the latter with a projection on each side, no central hump present, reddish-brown in centre, this colour reaching orbits on each side above, the remainder yellowish-brown, golden tomentum present on each side of antennal protuberance narrowed along orbits, and as a prominent vitta on each side extending from orbits to oral margin; cheeks yellow-brown; posterior orbits with golden tomentum; antennae yellowish-brown, short, the third joint moderately large, briefly ovate, arista long, bare; eyes bare.

Mesonotum reddish-brown with marked bluish-purple and violet iridescence; with well defined pale golden tomentose spots, situated as follows: a spot on each humeral angle, and a spot on each side on anterior margin between humeral angles and midline, a spot anterior to outer end of suture, about midway in position between the spots on humeral angles and anterior margin, a smaller spot on inner end of suture, a spot above and slightly behind wing root and a small ill-defined spot on posterior margin between lateral angle and midline; pubescence short, rather scanty, pale. Scutellum similar to mesonotum, strongly posterior angle, posterior trochanters triangularly produced at apex; posterior femora slightly thickened with a group of black spinose setae on each side of ventral surface near apex; posterior tarsi feebly curved. Wings hyaline, the costal cell and extreme base pale yellow, a faint ill-defined brownish mark in anterior portion opposite inner end of median cell, a larger ill-defined faint brownish patch at apex, including greater portion of cell R_5; *r-m* very long and oblique, reaching *m-c* well beyond the middle; cell R_5 closed on wing margin. Calypters golden with golden fringe; halteres yellow.

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Abdomen elongate, almost parallel-sided, very slightly narrowed on second segment; first segment reddish-brown with dark central vitta, lateral margins and apex; second segment black with greenish iridescence, a pair of small ovate yellow spots near anterior margin; third segment similar greenish-black, the apex diluted with red, with a pair of smaller more rounded spots near base, somewhat more outwardly situated; fourth and fifth segments reddish-brown with greenish iridescence; genital segments black, extruded; all the segments laevigate, with few fine punctures and very short sparse pale pubescence; longer pale pubescence at sides, particularly of first and second segments. Venter greenish-black, laevigate, the two apical segments reddish-brown, second segment with sides yellowish.

Legs comparatively long and slender, reddish-yellow, the posterior tarsi dark brown, paler at apex, all claws black with reddish-yellow base; posterior femora long, not incrassate, a few reddish-yellow spinose setae on each side of ventral surface near apex; posterior trochanters triangnlarly produced on inner side of femora. Wings clear, veins black, a short black transverse bar at middle, not extending beyond *vena spuria*, a black cloud near apex extending from anterior margin to beyond R_{4+5}, not involving extreme apex; *r-m* very oblique, situated well beyond middle of median cell. Calypters white with brown margin. Halteres pale yellow.

Length, 13 mm.

Hab.—New South Wales: Toronto (Filmer). A single female which perhaps may not be correctly placed generically. The long thin legs are not in keeping with other Australian species of *Xylota*, but the species appears linked in this respect through *X. illucens*, in which the legs are intermediate in size.

HARDIMYIA, n.g.

Genotype, *Chrysotoxum elongatum* Hardy.

Head semicircular, eyes bare, contiguous in male for a short distance, the upper and anterior facets somewhat larger than the others, eyes widely separate in ♀; front produced anteriorly; face moderately strongly produced at mouth border, not concave beneath antennae, but slightly concave above oral margin, no facial hump present. Antennae elongate, porrect, first joint cylindrical, second joint more than twice the length of first, slightly widened to apex, third joint broader than second, but somewhat shorter, laterally compressed, arista dorsal, subbasal. Thorax oblongate. Abdomen elongate, slightly narrowed on second segment, rather flat above, the general shape much as in some species of *Xylota*. Posterior femora strongly incrassate in both sexes, the posterior tibiae bowed. Venation as in *Xylota*, but *r-m* cross-vein opposite middle of median cell and rather less oblique.

Apart from the antennae, this genus has all the appearance of a species of *Xylota*, and I regard the two genera as closely allied.

I have already (Part i) given my reasons for removing *Chrysotoxum elongatum* from the Chrysotoxinae; the character of the elongate antennae does not appear to me to outweigh the other characters, which definitely ally the species with the Milesiinae. Apart from the position of *r-m*, *Hardimyia* differs from *Chrysotoxum* in the shape of the abdomen and in the thickened posterior femora.

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The venation is also different; M_{1+2} shows a distinct backward bend at the apex of the median cell and the oblique apical portion of the vein is distinctly sinuate and somewhat recurved at junction with R_{4+5}.

HARDIMYIA ELONGATA (Hardy).

Chrysotoxum elongatum Hardy, 1921, p. 13, Plate 1, fig. 1, 2.

In describing this species Hardy remarked that it probably did not belong to *Chrysotoxum*, but that it was placed there until its position could be ascertained more satisfactorily.

The sexes show some difference in coloration; in the ♂ there is a pair of large yellow spots on the second abdominal segment; these spots are absent in the ♀.

Hardy has recorded the species from a number of localities in Tasmania. Specimens are before me from Tasmania, Victoria, South Australia and New South Wales, but the species appears to be rare except in Tasmania.

EUMERUS Meigen.

Eumerus Meigen, 1822, p. 202.

Head broader than thorax; eyes more or less pubescent, sometimes almost bare, contiguous in male for a distance varying from a long space to little more than a point, sometimes very narrowly yet distinctly separated; wide apart in ♀; face rather flat, central knob absent. Antennae variable, generally short but large, third joint rounded or ovate, occasionally elongate, usually larger in ♀; arista bare, 3-jointed, placed before middle of joint. Thorax subquadrate, slightly arched, usually aeneous black with short pubescence; scutellum concolorous, the actual margin occasionally serrulate. Abdomen longer than wide, sides usually parallel or slightly widened about the middle; nearly always with three pairs of pale lunules; tip blunted in male, more pointed in female; pubescence short. Legs moderately strong, hind femora thickened, with short stout bristles below; hind tibiae usually slightly curved; hind metatarsi generally incrassate, sometimes widely dilatate in male, in some species the succeeding tarsal joints also dilated. Wings with cell R widely open, *r-m* cross-vein at or beyond middle of median cell; R_{4+5} often sinuous; M_{1+2} recurrent and strongly outwardly angulate in apical portion, the angle usually with a short appendix.

The above generic diagnosis is taken from Brunetti (1923), but is somewhat modified in the description of the venation.

Life History.—Two species—*E. strigatus* Fln. and *E. tuberculatus* Rond.—have been bred in Europe from onions and other bulbs and have become rather serious pests of narcissus in Great Britain. Little is known of the life history of Australian species, but two—including *E. aurifrons* Wied.—have been bred by H. Mann from prickly pear (*Opuntia* sp.). Dr. Bancroft bred one species—*E. peltatus* de Meijere—from fruit.

Two species have been described from Australia—*E. latipes* and *E. fulvicornis*. A third species, *E. transiens* Walker, does not belong to the genus, but to *Microdon*, and is a synonym of *M. vittatus*. Hardy (1921, p. 1) expressed the opinion that *Meredon muscaeformis* probably belonged to this genus; this is, I think, incorrect, as the description agrees well with *Psilota coerulea* Macquart.

In describing *E. marginatus* Grimshaw, from Honolulu, the author suggested that it might be an importation from Australia. This appears to be purely an assumption and no species agreeing with Grimshaw's description has been described or recorded from Australia.

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Two extralimital species—*E. aurifrons* Wied. and *E. peltatus* de Meijere—occur also in Australia; one (*E. peltatus*) was described from New Guinea, the other (*E. aurifrons*) is widely distributed in the Oriental region. A third species —*E. obliquus* F.—has apparently been introduced.

Two new species are described in the present paper; most species are rare and represented by but one or two specimens. Several unidentified females are also before me, but it has not been considered justifiable to describe these.

Distribution.—While so little is known of the Australian species it is impossible to define the distribution; so far, however, specimens have been taken only on the eastern coastal districts including Tasmania and in Western Australia. At least two species—*latipes ?* and *macquarti*—occur in Tasmania; one—*simplex* —in Victoria; four species—*macquarti, latipes ?, simplex* and *obliquus*—in the neighbourhood of Sydney and three in Queensland—*aurifrons, peltatus,* and *argyrogaster*, and two—*obliquus* and *latipes ?* in Western Australia. In addition I have seen unidentified females from Sydney and Woy Woy in New South Wales and from various places in Queensland. While some of the undetermined females may belong to described males, it is probable that the number of species found to occur in Australia will be greatly extended with more intensive collecting and study. It is to be expected that other Oriental and New Guinea species may make their appearance in N. Queensland.

The following table must of necessity be regarded as merely tentative; it is based largely on male characters, since the female sex of several is unknown.

Table of Species of Eumerus.

1. Antennae black; pale abdominal markings meeting in midline .... *E. obliquus* F.
   Antennae yellowish; lunules separate 2
2. Pubescence golden; posterior tarsi of ♂ dilatate, white, the posterior metatarsi not dilatate nor white .... *E. aurifrons* Wied.
   Pubescence of head never golden, posterior tarsi in ♂ not as above 3
3. Posterior metatarsi dilatate in ♂ 4
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4. The dilated posterior metatarsi clothed with brilliant silvery white pubescence .... *E. peltatus* de Meij.
   The dilated metatarsi brown .... *E. latipes* Macq.
5. Abdomen with long silvery pubescence on second and third segments in ♂ .... *E. argyrogaster*, n. sp.
   Abdomen not clothed as above 6
6. Posterior femora with small subapical flange on ventral surface .... *E. macquarti*, nom. nov.
   Posterior femora simple .... *E. simplex*, n. sp.

EUMERUS OBLIQUUS F.

Milesia obliquus Fabricius, 1805, p. 194.—*Eumerus ciliitarsis* Loew, 1848, p. 120. —For further references and synonymy see Kertesz, *Cat. Dipt.*, vol. v.

A robust thick-set species characterized by the abdominal lunules uniting across the median line.

♀. Eyes separated above by one-third of the distance from vertex to antennae and in front by approximately half that distance, clothed with short sparse whitish pubescence almost absent above; front widened anteriorly, vertex and ocellary region black with black erect hairs, a very narrow line of grey tomentum along the orbits, remainder of front densely clothed with greyish-white pubescence, punctate with black near ocelli, with long dense forwardly directed

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Mesonotum black, rather dull, with moderately close and conspicuous punctures, anterior margins and humeral angles whitish tomentose, the median line white to suture, thence two admedian white lines are traceable to half-way between suture and scutellum, suture white tomentose, lateral margins with similar white clothing more conspicuous behind suture; pubescence mainly greyish but appearing dark from most directions; scutellum black, the extreme apex serrate and obscured by a narrow fringe of grey tomentum; surface punctate as on mesonotum, pubescence rather long and denser than on mesonotum, greyish-white; pleural segments punctate as on dorsum, with greyish-white pubescence on mesopleuron, sternopleuron and pteropleuron. Abdomen rather short and broad, apex widely rounded, black, rather closely punctate, 2nd, 3rd and 4th segments with oblique greyish-white tomentose bands extending from the posterolateral angle of each segment to the anterior margin in the midline; the bands on the second segment appear very narrowly separated at the inner end; those on the hind and fourth distinctly meet, on the second and third segments the bands occupying oblique impressions; on the second segment a narrow sublateral band of greyish-white tomentum is visible when viewed from behind; this joins the oblique band in front of the posterolateral angle; pubescence mainly short and dark on disc, except on bands, longer pale pubescence present along lateral borders and clothing most of fourth segment. Legs black, the knees and extreme apices of tibiae narrowly brownish-yellow, tarsi infuscated, the apical segments brownish-yellow; pubescence long, whitish, rather dense, especially on posterior legs; posterior femora strongly incrassate with a short subapical serrate flange on anteroventral margin, and a few short spines on posteroventral margin; posterior tibiae strongly incrassate in apical half; posterior metatarsi incrassate, but not dilatate, tarsi simple. Wings clear, venation as in genus. Halteres yellowish-brown.

♂. Differs from female in having the eyes meeting in front for a short distance, the anterior facets being slightly larger than the others, and in having the posterior tarsi and metatarsi laterally compressed with the exception of the apical joint, the upper margin fringed with black bristle-like hairs. Dimensions, 7 mm.

Hab.—New South Wales: Sydney (on window 7.1.24). Western Australia: Swan River, Merredin (Newman). (Introduced.)

The general appearance is quite unlike any other known Australian species; it is much broader proportional to the length and this, with the hairiness of the clothing, gives the species a decided bee-like appearance. The presence of oblique bands in place of the ordinary lunules is also distinctive; they appear as a series of inverted Vs. From the descriptions, the species would appear to approach most closely to *E. flavicinctus* de Meijere among the Oriental species, but there are too many differences for the species to be regarded as identical.

The above description was written under the impression that the species was an undescribed one native to Australia; it agrees, however, so well with Loew's description of *E. cilitarsis*, a synonym of *E. obliquus*, that I have no doubt that the species has been introduced into Australia. The species appears to have a wide range in Africa and Southern Europe, but is not recorded by Brunetti from India.

greyish-white pubescence; face rather flat, somewhat retreating, clothed with dense pale tomentum and long pale pubescence similar to front, posterior orbits with white tomentum; antennae black, the third joint ovate, only slightly longer than deep.

Mesonotum black, rather dull, with moderately close and conspicuous punctures, anterior margins and humeral angles whitish tomentose, the median line white to suture, thence two admedian white lines are traceable to half-way between suture and scutellum, suture white tomentose, lateral margins with similar white clothing more conspicuous behind suture; pubescence mainly greyish but appearing dark from most directions; scutellum black, the extreme apex serrate and obscured by a narrow fringe of grey tomentum; surface punctate as on mesonotum, pubescence rather long and denser than on mesonotum, greyish-white; pleural segments punctate as on dorsum, with greyish-white pubescence on mesopleuron, sternopleuron and pteropleuron. Abdomen rather short and broad, apex widely rounded, black, rather closely punctate, 2nd, 3rd and 4th segments with oblique greyish-white tomentose bands extending from the posterolateral angle of each segment to the anterior margin in the midline; the bands on the second segment appear very narrowly separated at the inner end; those on the hind and fourth distinctly meet, on the second and third segments the bands occupying oblique impressions; on the second segment a narrow sublateral band of greyish-white tomentum is visible when viewed from behind; this joins the oblique band in front of the posterolateral angle; pubescence mainly short and dark on disc, except on bands, longer pale pubescence present along lateral borders and clothing most of fourth segment. Legs black, the knees and extreme apices of tibiae narrowly brownish-yellow, tarsi infuscated, the apical segments brownish-yellow; pubescence long, whitish, rather dense, especially on posterior legs; posterior femora strongly incrassate with a short subapical serrate flange on anteroventral margin, and a few short spines on posteroventral margin; posterior tibiae strongly incrassate in apical half; posterior metatarsi incrassate, but not dilatate, tarsi simple. Wings clear, venation as in genus. Halteres yellowish-brown.

♂. Differs from female in having the eyes meeting in front for a short distance, the anterior facets being slightly larger than the others, and in having the posterior tarsi and metatarsi laterally compressed with the exception of the apical joint, the upper margin fringed with black bristle-like hairs. Dimensions, 7 mm.

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EUMERUS AURIFRONS Wied.

Eumerus aurifrons Wiedemann, 1824, p. 32; de Meijere 1908, p. 218; Brunetti, 1923, p. 252, Pl. vi, fig. 2, 3.—*E. splendens* Wiedemann, 1830, p. 114; Brunetti, *op. cit.*, p. 218.

A widespread Oriental species whose range includes Queensland. The distinctive yellow clothing on the head, the separated eyes in the male and the structure of the hind tarsi in the same sex render it readily recognizable. The posterior metatarsi are normally incrassate, but not dilatate, dark with a narrow yellow apex; the remaining tarsal joints are flat, dilated and snow white in colour. Mr. J. Mann has bred this species from prickly pear (*Opuntia*).

Hab.—Queensland: Great Palm Island (Hardy, May, 1925), Brisbane (Mann), Townsville (Dodd, 26.6.02); extra-limital to India.

EUMERUS PELTATUS de Meijere.

Eumerus peltatus, de Meijere, 1908, p. 223.

Specimens of both sexes have been bred by Dr. T. L. Bancroft from a native fruit, and by Mr. J. Mann from rotting prickly pear (*Opuntia* sp.).

The species is easily distinguished in the male by the enormously dilated hind metatarsi. The whole of the hind tibiae and tarsi are clothed with long silvery white pubescence, but only the metatarsi are dilated, the tarsi being of normal size. The female is hardly to be distinguished from the females of other allied species; compared with the female of *E. simplex* it differs in the pubescent eyes and in the denser white pubescence of the anterior portion of the front and of the face; the posterior metatarsi are not dilated, but are brown, tipped with a little white pubescence; the other posterior tarsal joints are similarly though more sparsely tipped with white pubescence.

Hab.—*Queensland*: Eidsvold (Dr. T. L. Bancroft), Brisbane (J. Mann); extra-limital, New Guinea (de Meijere).

EUMERUS LATIPES Macq.

Eumerus latipes Macquart, 1846, p. 133.

"Ater. Abdominie lunulis albis. Pedibus nigris, tibiis meta-tarsisque posticis dilatatis.

"Long 3½l. ♂. Face et front dénudés. Antennes brunâtres. Yeux nus. Thorax à reflets verts et violets. Abdomen allongé, d'un noir bleuâtre. Ailes grisâtres; première cellule postérieure anguleuse, à deux appendices.

"De la Nouvelle-Hollande, Collection de M. Bigot".

The above description is so short as to be almost worthless, except for the reference to the posterior tibiae and metatarsi. If Macquart is correct in describing the tibiae as dilatate I have not seen the species. I believe, however, that the name should apply to a species in which the posterior metatarsi are widely dilatate, but the posterior tibiae at the most only incrassate. The eyes also are pubescent, not bare as described by Macquart, who, however, was apparently dealing with a denuded specimen, while the legs, though black, have the knees yellow.

A female in Mr. Hardy's collection from Hobart (Jan., 1924) and one in the National Museum from the same locality (C. E. Cole 13.1.18) appear to belong to this species. They are hardly to be separated from the species herein described as *E. simplex*, except by the pubescent eyes.

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EUMERUS ARGYROGASTER, n. sp.

♂. A bronzy-black species with brilliant silvery abdominal pubescence. Head black; eyes contiguous for a considerable distance, densely brown pubescent, the upper facets somewhat, but not greatly, larger than the lower; ocellary triangle elongate, black, shining with dark erect hairs; frontal triangle small, with dark hairs; face retreating towards oral margin, rather flat, black with faint greenish iridescence, pubescence dark; cheeks with lower posterior angle of orbits with some white pubescence; posterior orbits mostly dark, but with some white tomentum below and a small spot of similar colour opposite humeral callosity; antennae yellowish-brown, the third joint infuscated along the anterior upper margin, rather elongate, distinctly longer than deep. Mesonotum bronzy-black with purple reflections in places, some whitish tomentum on extreme anterior margin and on humeral angles, pubescence erect, mainly dark, but with some whitish prescutellar hairs; scutellum similar to dorsum, with a distinct serrated apical flange of about twelve dentations, pubescence dark, both mesonotum and scutellum shining; finely and not closely punctate; pleural segments similar, pubescence sparse, whitish on sternopleuron, pteropleuron and posterior edge of mesopleuron, dark elsewhere. Abdomen elongate, black; seen from behind the usual three pairs of lunules are present on the second, third and fourth segments, that on the second being abbreviated to a small spot on each side of middle line; seen from in front the lunules on the second and third segments are completely concealed by long decumbent brilliant silver pubescence which clothes the abdomen from the basal third of second segment to the apex of third; venter dark with some fine whitish pubescence on sternites. Legs bronzy-black, the extreme apex of femora and the base of apex of tibiae brownish-yellow; anterior tarsi yellowish-brown, the metatarsi somewhat infuscated; intermediate legs wanting; posterior femora not greatly thickened, simple, with a few small spines on ventral surface; posterior tibiae noticeably, but not greatly, incrassate in apical half; posterior metatarsi strongly incrassate, but not dilatate, black, the extreme apex yellowish, other tarsal joints small, narrow, brownish; pubescence on hind legs rather sparse, mainly whitish on coxae and femora, at extreme base and on dorsal apical third of tibiae and on apex of metatarsi; golden pubescence present on under surface of apex of tibiae and of metatarsi and tarsi. Wings hyaline; venation as in genus; halteres brown.

Length, 7 mm.

Hab.—Queensland: Eidsvold (28.4.24, Bancroft).

Described from a single male given me by Dr. I. M. Mackerras. The species is unique, at any rate among known Australian forms, in the presence of the long silvery abdominal pubescence; this is practically invisible from behind, but presents a most brilliant appearance when the insect is viewed from in front. This clothing is probably sexual, but no female has been found which could be regarded as conspecific. Two males have recently been sent me, taken by Mr. F. A. Perkins on Palm Island, N. Queensland. They differ somewhat in the extent of the white pubescence on the abdomen but are probably both somewhat abraded.

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*EUMERUS MACQUARTI, nom. nov.

Eumerus fulvicornis Macquart, 1850, p. 146 (nec *E. fulvicornis* Macquart, 1834, p. 528).

I identify as this species several specimens from Tasmania and New South Wales which agree closely with Macquart's description. In both sexes there is a slight flange-like projection from the posteroventral edge of the hind femora which bears one or two small spines. This projection is not mentioned by Macquart and his name would apply almost equally well to another species with simple femora; in the latter species, however, the wings are absolutely clear, whereas in the present specimens the wings are slightly shaded with brown, corresponding with Macquart's description, "Ailes claires; nervures un peu bordées de brunâtre".

Hab.—New South Wales: Sydney (24.9.22). Tasmania: Mt. Wellington (G. H. Hardy, 4.3.17, Jan., 1924), Hobart (G. H. Hardy, 3.10.15, Jan., 1924).

EUMERUS SIMPLEX, n. sp.

Closely allied to *E. macquarti*, but with simple femora and clear wings.

♂. Head black; eyes bare, contiguous for a short distance anteriorly; finely faceted, the anterior facets only slightly larger; vertex and ocellary triangle black, set with black hairs, the apical portion of ocellary triangle grey tomentose with grey pubescence; frontal triangle with ochraceous tomentum and dark pubescence; face rather flat, somewhat retreating, black, slightly bluish, sparsely grey tomentose with dark pubescence; posterior orbits white tomentose except above, with some sparse white pubescence at inferior angle. Antennae brownish-yellow, the third joint somewhat darkened along upper margin; slightly longer than deep. Mesonotum black, rather feebly metallic iridescent, somewhat bronzed in centre, moderately finely punctate, a pair of white tomentose admedian lines present from outer margin to beyond suture, only visible when viewed from behind; pubescence rather short and fine, mainly pale. Scutellum bronzy-black, shining, punctate as on mesonotum, with well marked apical flange, bearing about fourteen dentations, pubescence as on dorsum. Pleurae black, slightly brassy, with rather sparse pale pubescence. Abdomen elongate, black, finely punctate, somewhat brassy at sides of segments, with three pairs of curved transverse white tomentose lunules on second, third and fourth segments, situated near or slightly beyond middle of segment anteroposteriorly, and not meeting across midline, those on second segment shortest; pubescence short, appressed, mainly dark, some scanty whitish pubescence at sides of segments, longer at basal angles of second. Legs mainly black with metallic reflections, the extreme base of femora, knees and apex of tibiae yellowish, tarsi infuscated above, with dense golden yellow clothing beneath; posterior femora simple, not incrassate and without flange, a row of short spines on each side of ventral surface before apex; posterior tibiae slightly thickened in apical half, but not greatly incrassate; posterior metatarsi longer and thicker than other tarsal segments, but not greatly incrassate or dilatate; pubescence rather scanty, mainly pale, a moderately conspicuous patch at apex of hind tibiae. Wings clear; venation normal; calypters brownish-yellow.

♀ resembles ♂; eyes separate, bare; front rather narrow, width about half that of one eye, black, shining, moderately closely set with small punctures, with black hairs; orbits narrowly grey tomentose in anterior portion; otherwise as in ♂.

Dimensions, 6 mm.

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Hab.—Victoria and New South Wales. Holotype, Cheltenham (17.11.13, C. E. Cole); allotype, Eltham (22.2.19, C. E. Cole); paratype ♂ Sydney (24.9.22).

The paratype is slightly smaller (5 mm.) and the metallic reflections differ slightly in different parts; these reflections do not, however, appear to be constant. The species may be recognized by the simple posterior legs in the male and by the bare eyes. Under high powers of magnification a few separate fine hairs may be detected, but with an ordinary hand lens the eyes appear quite bare, not densely pubescent as in *E. macquarti* and other species.

Subfamily VOLUCELLINAE.

"Antennae moderately long, and even if elongate, mainly pendent; arista normally plumose; face very considerably produced into a blunt or more conical snout, sometimes of considerable length. Body usually robust, not linear or attenuated. Legs simple. Wings with marginal cell closed or open; third vein not looped downward into first posterior cell; fourth vein distinctly recurrent at tip, ending some distance from wing-border; anterior cross-vein before middle of discal cell" (Brunetti, 1923, p. 134).

The above description is copied directly from Brunetti. The characters cited are not very satisfactory, though Brunetti regards the subfamily as a natural one. The only genus occurring in Australia is *Graptomyza*, which affords exceptions to at least two of the main characters of *Volucella*. Thus cell R_1 is widely open, not closed as in *Volucella*, and the arista, though normally plumose, may be bare or practically so. These are two of the three characters given by Brunetti in his key to the subfamilies of the Syrphidae, the third character, the fourth vein (M_{1+2}) recurrent at tip, occurs also in several genera of Syrphinae.

There seems little indeed to exclude the genus *Graptomyza* from the Syrphinae, except the occurrence in probably the majority of the species of a plumose arista. Brunetti states that a plumose arista is entirely foreign to the Syrphinae (*op. cit.*, p. 153).

While endemic species of *Volucella* are unknown from Australia, several species of American Syrphidae, including at least two species of *Volucella*, have been brought over by the Prickly Pear Experiment Committee for experiments in the control of prickly pear (*Opuntia sp.*). There is no evidence, however, that these have succeeded in establishing themselves outside the laboratory cages.

GRAPTOMYZA Wied.

Graptomyza Wiedemann, 1830, p. 206; Brunetti, 1903, p. 135.

Head as broad as or broader than thorax, transverse; epistome produced as a conspicuous snout, projecting diagonally downwards, varying in length in different species; proboscis elongate, then bifid at tip. Eyes widely separated in both sexes (at least in Australian species). Antennae with first and second joints small, third very elongate, three or four times longer than deep, porrect or somewhat drooping, compressed, arista bare or conspicuously plumose. Thorax short, subquadrate with rounded corners; humeri with projecting calli generally very distinct, softly pubescent, but with a distinct chaetotaxy; scutellum with distinct deep transverse depression on disc (at least in Australian species). Abdomen shortly oval, or a little narrowed at tip, arched, thick, softly pubescent. Legs comparatively short and weak. Wings of normal size, *vena spuria* absent; M_{1+2} and M_{3+4} bent sharply up in apical portion generally at a right or acute angle, the section nearly or quite straight, anal angle of wing and alulae well developed; squames of normal size, with fringes.

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Graptomyza Wiedemann, 1830, p. 206; Brunetti, 1903, p. 135.

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The above description is taken, somewhat modified, from Brunetti. The latter author makes no mention of the eyes in the male, possibly because all the species he records are represented by female specimens. De Meijere (1908), in dealing with the Oriental and Papuan species, mentions the sex of his specimens in only two instances; in three of the species described as new by that author the sex of his specimens, unique in each instance, is not given. In the Australian specimens before me, where both sexes are represented, the eyes are widely separated in both and indeed there is little to distinguish the sex except the genitalia.

The possession of a definite chaetotaxy is rare in the Syrphidae; Brunetti says that it generally consists of "one or two presutural bristles, three supra-alar or post-alar, two or three on posterior calli, two notopleural and a row on hind margin of dorsum; also scutellum bearing strong bristles, or with a general row of numerous bristles on hind margin, this system apparently slightly varying with the species". I find in the Australian species that the chaetotaxy varies widely with the species, though apparently constant within each.

Graptomyza has hitherto been represented in Australian faunal lists by but one species, *Graptomyza maculipennis* de Meijere, described from Sydney. This still remains the only southern representative of the genus, but I have recently received from Mr. F. P. Dodd, of Kuranda, specimens of three distinct species, allied to New Guinea forms, but all apparently distinct from any described by de Meijere.

Table of Species of Graptomyza.

1. Wings pictured .... *G. maculipennis* de Meij.
   Wings clear 2
2. Mesonotum black with yellow shoulders; abdomen banded ...... *G. flavicollis*, n. sp.
   Mesonotum mainly pale, with darker broad median area; abdomen spotted or striped 3
3. Abdominal markings confined to a spot near posterolateral angles of second and third segments; ♂ with intermediate legs simple .... *G. doddi*, n. sp.
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GRAPTOMYZA MACULIPENNIS de Meij.

Graptomyza maculipennis de Meijere, 1908, p. 279, Pl. 8, fig. 28, 29.

A well marked species readily distinguished from other known Australian forms by the pictured wings.

The mesonotum is dark and the abdomen reddish-brown with the somewhat obscure markings described by de Meijere; the chaetotaxy appears to be as follows: 2 notopleural, 2 mesopleural, 3 supra-alar, 3 post-alar, a row along posterior border of which the outer bristles are the longest, and two apical scutellar bristles; the bristles are somewhat obscured by the pubescence.

Hab.—New South Wales: Sydney, Botany Bay (Biro, 1900), Roseville (6.10.14 and 8.1.23).

GRAPTOMYZA FLAVICOLLIS, n. sp.

♀. A species with black thorax with yellow shoulders, and yellowish abdomen with black transverse markings.

Front broad, posterior half black, anterior yellow, a narrow band in front of black and a broad longitudinal band, including lunule, tawny yellow, with distinct discrete round punctures, more obvious on the black and absent from

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Front broad, posterior half black, anterior yellow, a narrow band in front of black and a broad longitudinal band, including lunule, tawny yellow, with distinct discrete round punctures, more obvious on the black and absent from the clear yellow areas at the sides of lunule; face clear yellow, a darker, rather obscure brownish median vitta present and a similar band from lower border of eye to oral margin, outline of face concave below antennae, thence produced to oral margin, the facial knob moderately distinct, epistome produced downwards and forwards, less prominent than in *G. doddi*; pubescence on head very short and scanty, practically restricted to vertex and dark portion of front, some yellowish hairs on genal angles; eyes practically bare, a few microscopic hairs visible with high magnification. Antennae tawny-yellow, third joint elongate, about twice as long as wide, arista with short, rather sparse hairs on dorsal border. Mesonotum shining black with slight purple reflections, humeral callus and a square patch immediately behind callus clear yellow, pubescence fine, appressed, brownish; scutellum clear yellow, with deep depression shaped as in *G. doddi* overhung by some recurved fine yellow hairs, without obvious tomentum in depth; pleurae black, a large yellow patch present on mesopleuron; chaetotaxy reduced; two short, rather stout, black supra-alar bristles with some short, black hairs above wing roots; three black post-alar bristles, one long yellow mesopleural bristle and a pair of short, yellow bristles on apical margin of scutellum widely separated and arising each from a small granule; bristles on posterior margin of mesonotum represented by a row of fine, yellow hairs. Abdomen brownish-yellow with black, transverse markings; first segment entirely yellow, second segment with a broad, transverse band, obliquely narrowed at sides where it reaches posterior border, the upper margin of band shallowly indented in midline; third segment with a similar, but rather narrower band produced forwards in midline almost to anterior margin, the extreme sides also blackish; fourth segment with a longitudinal black median vitta narrowed posteriorly and a black oblique mark along each side from basal third to apex, the extreme basolateral angle also blackish; pubescence short, appressed, brownish. Venter brownish-yellow. Legs brownish-yellow, the tarsi lighter, the posterior femora rather thicker than normal with a row of short spines on each edge of ventral surface before apex. Wings clear, venation normal. Calypters and halteres yellowish.

Length, 4 mm.

Hab.—N. Queensland: Cairns District (F. P. Dodd).

Described from a single female sent to me by Mr. Dodd of Kuranda. The species is quite distinct from any known Australian species and does not agree with the description of any Oriental or New Guinea form. The spines on the under surface of the posterior femora appear to be most unusual in the genus, since in his generic diagnosis one of the characters cited by Brunetti is, "Legs . . . . . never incrassated, nor in any way armed".

GRAPTOMYZA DODDI, n. sp.

A yellowish-brown species with lateral dark spots on abdomen.

♂. Head yellow, the upper portion of occipital region and the spot on which the ocelli are situated black; front broad, wider than the width of an eye, subquadrate, parallel-sided; face strongly produced anteriorly to facial knob, thence falling almost perpendicularly to oral margin, pubescence fine, rather sparse, yellow; eyes evenly faceted, bare; antennae darker yellow, almost golden, the third joint long, oblongate, arista rather sparsely plumose on upper surface. Mesonotum yellow with a broad somewhat darker yellowish-brown central area, narrowed in front and bearing a dark, blackish W-shaped mark posteriorly, the triangle between the central limbs bright yellow; scutellum yellow; depression the clear yellow areas at the sides of lunule; face clear yellow, a darker, rather obscure brownish median vitta present and a similar band from lower border of eye to oral margin, outline of face concave below antennae, thence produced to oral margin, the facial knob moderately distinct, epistome produced downwards and forwards, less prominent than in *G. doddi*; pubescence on head very short and scanty, practically restricted to vertex and dark portion of front, some yellowish hairs on genal angles; eyes practically bare, a few microscopic hairs visible with high magnification. Antennae tawny-yellow, third joint elongate, about twice as long as wide, arista with short, rather sparse hairs on dorsal border. Mesonotum shining black with slight purple reflections, humeral callus and a square patch immediately behind callus clear yellow, pubescence fine, appressed, brownish; scutellum clear yellow, with deep depression shaped as in *G. doddi* overhung by some recurved fine yellow hairs, without obvious tomentum in depth; pleurae black, a large yellow patch present on mesopleuron; chaetotaxy reduced; two short, rather stout, black supra-alar bristles with some short, black hairs above wing roots; three black post-alar bristles, one long yellow mesopleural bristle and a pair of short, yellow bristles on apical margin of scutellum widely separated and arising each from a small granule; bristles on posterior margin of mesonotum represented by a row of fine, yellow hairs. Abdomen brownish-yellow with black, transverse markings; first segment entirely yellow, second segment with a broad, transverse band, obliquely narrowed at sides where it reaches posterior border, the upper margin of band shallowly indented in midline; third segment with a similar, but rather narrower band produced forwards in midline almost to anterior margin, the extreme sides also blackish; fourth segment with a longitudinal black median vitta narrowed posteriorly and a black oblique mark along each side from basal third to apex, the extreme basolateral angle also blackish; pubescence short, appressed, brownish. Venter brownish-yellow. Legs brownish-yellow, the tarsi lighter, the posterior femora rather thicker than normal with a row of short spines on each edge of ventral surface before apex. Wings clear, venation normal. Calypters and halteres yellowish.

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♀. Resembles male, but rather larger and more robust, forehead with black of occiput extending approximately half-way down front; chaetotaxy all black, in others the three posterior bristles black only, mesopleural bristle always yellow.

Dimensions, ♂, 4 mm.; ♀, 5 mm.

Hab.—North Queensland: Cairns District (F. P. Dodd, 3 ♂, 5 ♀—no other data).

This species appears related to *G. punctata* de Meijere from New Guinea, but differs in the thoracic and abdominal markings.

In the females there is frequently a median dark vitta on the fourth abdominal segment and an ill-defined mark at posterior margin of second segment in the middle line; the yellow pubescence on the thorax is concentrated along two admedian lines, not evenly diffused as in the male.

GRAPTOMYZA PLUMIFER, n. sp.

♂. A golden-yellowish species with three dark marks on the abdominal segments and plumed intermediate legs.

Head yellow, somewhat tawny, the vertex dark brown; front over three-fourths the eye width at vertex, gradually widened anteriorly, yellow except for narrow brown band at vertex, surface nitid with scattered discrete small punctures, not tomentose, but with some rather scanty, short, pale pubescence, dark on vertex; face similarly coloured, deeply concave below antennae, thence produced to oral margin, the central knob moderately distinct, epistome well produced, but rather less than in *G. doddi*; eyes bare, evenly faceted. Antennae yellow, the third joint large oblongate, the depth approximately three-fifths the length, arista dorsal, with some short sparse hairs on upper side. Mesonotum yellow, with a broad central darker brown area extending the length of mesonotum, the lateral margins similarly stained, pubescence short, decumbent, yellow; scutellum yellow, with deep transverse depression as in *G. doddi*, but deeper and apparently containing but scanty tomentum in depth; pleural segments yellow, laevigate, with some scanty yellow pubescence; chaetotaxy: 1 supra-alar, 3 post-alar, a row along posterior margin, 1 mesopleural and 2 scutellar bristles, the latter short, widely separated and each arising from a small granule, all bristles yellow and shorter than in *G. doddi*. Abdomen yellow, the second, third and fourth segments with a median, longitudinal black mark, the whole forming an interrupted vitta, widest on second segment; the second and third segments also with a narrow oblique mark near transversely oval, the basal side slightly flattened, filled with fine yellow tomentum; pleurae yellow; pubescence soft, yellow, moderately dense on dorsum; chaetotaxy: 2 notopleural, 1 supra-alar, 3 post-alar (one of which is at extreme inner end of posterior callus) and one prescutellar bristle on each side of dorsum, the prescutellar and inner post-alar bristles are dark, the others yellow; mesopleuron with a single yellow bristle; scutellum with an apical pair of dark bristles. Abdomen yellow-brown, becoming darker posteriorly, second and third segments each with a small dark mark on posterior border on each side near, but not at, the posterolateral angle; pubescence fine, apparently dark with some brighter yellow pubescence on base of second, and at basolateral angles of third and fourth segments. Venter yellowish-brown, pubescence yellow. Legs yellow, the apices of posterior femora and tibiae and the posterior tarsi infuscated; the posterior tibiae are slightly darker than the other legs and bear some short black bristle-like hairs on anteroventral surface in outer half; pubescence otherwise mainly yellow. Wings clear, venation normal. Calypters and halteres yellow.

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Length, 4 mm.

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